520 West 28th Street

NEW YORK, NEW YORK

Final Engineering Report

NYSDEC Site Number: C231082

Prepared for:

28th Highline Associates, L.L.C.

c/o The Related Companies

60 Columbus Circle

New York, NY 10023

Prepared by:

61 Broadway, Suite 1601

New York, NY 10006

DECEMBER 2014

CERTIFICATIONS

I, Keith P. Brodock, P.E., am currently a registered professional engineer licensed by the State of New York, I had primary direct responsibility for implementation of the remedial program activities, and I certify that the Remedial Action was implemented and that all construction activities were completed in substantial conformance with the Department-approved Remedial Action Work Plan.

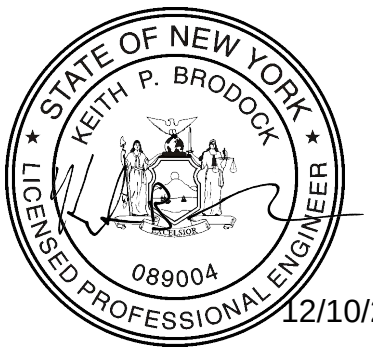
I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the Remedial Action Work Plan and in all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established in for the remedy.

I certify that all documents generated in support of this report have been submitted in accordance with the DER's electronic submission protocols and have been accepted by the Department.

I certify that all data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Keith P. Brodock P.E., of Integral P.C. located at 61 Broadway, Suite 1601, New York, NY, am certifying as Owner's Designated Site Representative for the Site.

Date signed and sealed:



Keith P. Brodock, P.E.

NY License #089004

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LIST OF ACRONYMS

Acronym	Definition
AARCO	ARRCO Environmental Services Corp.
ADT	aquifer drilling and testing
AWQS	ambient water quality standards
BCA	brownfield cleanup agreement
BCP	brownfield cleanup program
COC	certificate of completion
DUSR	data usability summary report
FER	final engineering report
FSP	field sampling plan
FSSR	field sampling summary report
GAC	granulated activated carbon
GPR	ground penetrating radar
GRO	gasoline range organics
HASP/CAMP	health and safety plan/community air monitoring plan
IRM	interim remedial measure
MW	monitoring well
NAPL	non aqueous-phase liquid
PELs	permissible exposure level
PID	photoionization detector
QAPP	quality assurance project plan
RAO	remedial action objectives
RAWP	remedial action work plan
RIR	remedial investigation report
RIWP	remedial investigation work plan
RPZs	reduced pressurized zone backflow prevention devices
SCOs	soil cleanup objectives
SEP	soil excavation plan
SMMP	soils materials management plan
SOE	sequenced support of excavation
SVOCs	semi-volatile organic compounds
SW	sidewall
SWPPP	storm water pollution prevention plan
TCL	target compound list
TOGS	technical operational guidance series
TPH	total petroleum hydrocarbons
UST	underground storage tank
VOC	volatile organic compound

FINAL ENGINEERING REPORT

1.0 BACKGROUND AND SITE DESCRIPTION

28th Highline Associates, L.L.C. entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) in April 2013 (amended August 2014), to investigate and remediate a .51-acre property located in the West Chelsea section of the Borough of Manhattan, New York. The property was remediated to Track 1 Unrestricted Use and will consist of a 22-story residential and commercial mixed use building.

The Site is located in the County of New York, New York and is identified as Block 699, Lot 43 on New York City Tax Map #8b. The Site is situated on an approximately .51-acre area bounded to the north by West 28th Street; to the east by 10th Avenue; to the south by West 27th Street and to the west by 11th Avenue. Adjacent surrounding properties include mixed use, commercial and residential buildings to the south, west and east; manufacturing to the south; and the High Line Park (former elevated rail structure) to the east (see Figure 1). The boundaries of the Site are fully described in Appendix A: Survey Map, Metes and Bounds.

An electronic copy of this final engineering report (FER) with all supporting documentation is included as Appendix B.

2.0 SUMMARY OF SITE REMEDY

2.1 Remedial Action Objectives

Based on the results of the Remedial Investigation (RI), the following Remedial Action Objectives (RAOs) were identified for this Site.

RAOs for Public Health Protection

a) Prevent ingestion and direct contact with contaminated soil.

b) Prevent inhalation of, or exposure to, contaminants volatilizing or associated with dust from contaminated soil.

c) Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

d) Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

For Environmental Protection:

a) Prevent impacts to biota and animals from ingestion and direct contact with the contaminated soil.

b) Remove soil exceeding the soil cleanup objectives (SCOs) to the greatest extent practicable.

c) Monitor volatile organic compound (VOC) concentrations in groundwater.

The Site was remediated in accordance with the remedy selected by the NYSDEC in the Decision Document dated December 2013.

The factors considered during the selection of the remedy are those listed in 6NYCRR 375-1.8. The following are the components of the selected remedy:

1. Excavation to bedrock and removal of all onsite soil/fill, exceeding Unrestricted Use SCOs listed in Table 1;

2. Importation of construction fill meeting Unrestricted Use SCOs (none imported);

3. Design and construction of a combination of a small sheeted pits, secant piles and battered secant piles along the perimeter of the southern adjacent buildings;

4. Complete removal of the underground storage tank (UST) vault and petroleum impacted soil (if any);
5. Dewatering and treatment of impacted groundwater;
6. Nonaqueous-phase liquid (NAPL) source identification/recovery;
7. Collection and analysis of endpoint soil samples to confirm and document removal of targeted materials;
8. Placement of a waterproofing membrane beneath the building slab and along foundation side walls as part of new construction; and
9. Development and execution of plans for the protection of onsite workers, community, and environment during remediation and construction activities.

Remedial activities were completed at the Site in October 2014.

3.0 SUMMARY OF PRE-REMEDIAL ACTIVITIES

All pre-remedial activities were overseen by a representative of Integral Engineering, P.C. (Integral).

3.1 Interim Remedial Measures

On August 1, 2013, Integral implemented a NYSDEC-approved interim remedial measure (IRM) at the Site. The IRM included the excavation and decommissioning of two, 550-gallon USTs located in the southwestern portion of the Site. The tanks were removed by ARRCO Environmental Services Corp. (AARCO), a New York City Fire Department (FDNY) licensed contractor. Documentation of NYSDEC approval of this work plan is provided in Appendix C.

The UST IRM consisted of:

- Excavation, decommissioning, and disposal of two, 550-gallon USTs;
- Partial removal of the UST concrete enclosure;
- Disposal of approximately 1,100 gallons of wastewater; and
- Collection of endpoint samples.

The results of the UST IRM were documented in an addendum to the NYSDEC approved Remedial Investigation Report (RIR). No impacts were observed as the cover fill and concrete were removed from around the tanks. No staining or odor was noted and no perforations or defects to either tank were identified. No VOCs were detected above Unrestricted Use SCOs in either endpoint sample collected. Concentrations of semivolatile organic compounds (SVOCs), consistent with historic fill, were detected above Unrestricted SCOs, but below Restricted Residential SCOs. The remaining portion of the concrete vault and all of the surrounding soil was excavated to bedrock in 2014 as part of the approved Remedial Action.

Both tanks were previously utilized for the containment of gasoline. Accordingly, they are not the source of the NAPL found in onsite well (MW-1) and offsite well (MW-6). Liquid waste and UST disposal manifests are provided in Appendix D.

3.2 Pre-Design Investigation

Prior to the implementation of the Remedial Action, soil samples were collected from native soil at varying anticipated excavation depths within the area of future remedial excavation. The purpose of this sampling was to confirm the vertical extent to

which the Remedial Action would need to be implemented to meet Track 1 Unrestricted Use SCOs.

On December 2 and 3, 2013, 14 pre-design soil samples were collected as pre-excavation endpoint samples and were analyzed for:

- Total VOCs via USEPA Method 8260B;
- Total SVOCs via USEPA Method 8270C;
- TAL Metals via USEPA Method 6010B/7470A;
- Total PCBs via USEPA Method 8082; and
- Pesticides via USEPA 8081A.

While 10 of 14 samples met Unrestricted Use SCOs, these samples did not serve as final endpoint samples because final excavation elevations in the areas in which they were collected ultimately changed. The modification of final excavation elevations resulted in re-confirmation sampling at the associated adjusted final depths during the remedial excavation.

On March 10, 2014, 12 pre-design samples were collected from three boring locations (two locations directly against the building on Lot 22 and one location directly against the building on Lot 23 (see Figure 2). The building located on Lot 23 is the only building along the southern Site boundary whose structure was built to its property boundary. All other southern adjacent buildings do not extend to their respective property lines. Thus, the only area along the southern Site boundary where the secant wall did not encroach into a neighbor's lot is along Lot 23. In order to remove all soil within the Site's lot line along Lot 23, and without compromising the structural integrity of the building on the Lot, a sequenced support of excavation (SOE) was designed. This SOE consisted of several small (approximately 3- by 5-ft) sheeted pits that were installed directly beneath the spread footing on Lot 23 (which extends ~12 in. onto the Site) and approximately 1- to 2-in. past the Site's southern boundary and into Lot 23.

The aforementioned borings were advanced and sampled in 1-ft intervals beginning from 8- to 10-ftbg and terminating at 15- to 17-ftbg in order to inform the depth at which the sheeted pits needed to be excavated to meet Unrestricted Use SCOs. The results of these samples, and the alternate means of SOE employed to meet Track 1 requirements, are described in detail in Section 4.3 of this Report.

The Pre-Design Sampling Plan was documented in Section 3.5 of the NYSDEC

approved Remedial Action Work Plan (RAWP). Pre-design sample locations and depths are depicted on Figure 2. Pre-design sampling results are provided in Tables 2 and 3. Laboratory analytical reports are provided in Appendix E. The data usability summary report (DUSR) is provided in Appendix F.

The vertical extent for excavation of soil exceeding Unrestricted Use SCOs was determined, in part, by the data obtained during the pre-design sampling. Confirmation samples collected along the bottom of the excavation confirmed that all soil exceeding Unrestricted Use SCOs had been removed. Due to the removal of all soil/fill within the boundary of the Site, sidewall samples were collected in order to document offsite soil conditions. Endpoint sample results are discussed in detail in Section 4.4.3of this Report.

3.3 Tanks and VOC-Affected Soil Encountered

On March 14, 2014, AARCO was onsite to conduct a subsurface investigation of two suspect areas which were identified during a ground penetrating radar (GPR) survey conducted prior to construction mobilization. One potential UST was identified in the northern portion of the Site and a large metal anomaly was identified near the southern boundary at adjacent Lot 22. New York Concrete Corp. (NYCC), the foundation contractor, conducted the investigation with their machines under the oversight of AARCO. Following breaking of concrete and excavation of fill material to approximately 2 ftbg, a 550-gallon UST was encountered in the northern portion of the property. Two feet of water was measured within the tank, with an unknown thickness of an unidentified solidified material (potentially concrete or soil) present on the tank bottom below the water. The tank was left uncovered in the ground and was removed on March 18, 2014. The metal anomaly located in the southern portion of the Site adjacent to Lot 22 was identified as two electrical conduits and large metal scraps. No UST was found in this location.

On March 18, 2014, prior to excavation, AARCO removed approximately 400 gallons of sand and water from the tank via a vacuum truck for containerizing the liquid/sediment and transporting it for proper disposal at a licensed facility (waste manifests are provided in Appendix D. Upon complete removal of the tank contents, it was excavated using a backhoe, photographed, and then loaded into AARCO's tri-axle truck for offsite disposal. No impacts to soil were observed. No staining or odor was noted and no perforations or defects to the tank were identified. Four confirmation sidewall soil samples (north, east, south, and west) and one bottom endpoint soil sample was collected from the UST excavation for laboratory analysis of VOCs and Base Neutral SVOCs. No VOCs were detected above Unrestricted SCOs. Concentrations of

SVOCs, consistent with historic fill, were detected above Restricted Residential SCOs in three of six samples. Following endpoint sample collection, the UST excavation was backfilled with approximately 8 yards of clean concrete aggregate. All surrounding soils and backfilled aggregate were excavated and disposed of as part of the Remedial Action.

UST and UST confirmation sample locations and depths are depicted on Figure 3. Confirmation sampling results are provided in Table 4. The discovery and excavation of the UST was documented and submitted to the NYSDEC in Weekly Brownfield Cleanup Program (BCP) Construction Reports dated March 10, 2014 and March 17, 2014, respectively.

On May 30, 2014, a slight odor (potentially petroleum in nature) was observed during pre-trenching activities along the western Site boundary. Sidewalls were continuously logged and screened with a photoionization detector (PID) from grade to the bottom of the trench depth. Approximately 20- to 30-yds of odorous soil was stockpiled separately and a sidewall sample was collected in the area of highest suspected contamination (D1-SW). Analytical results of the sidewall sample collected indicated no exceedences of VOCs above Unrestricted SCOs and no exceedences of petroleum related SVOCs above Unrestricted Use SCOs. Offsite sidewall sample locations are depicted on Figure 4 and the results are summarized in Table 5.

Pre-trenching along the western Site boundary was performed in preparation for sheeting installation. Generally, obstructions were encountered at approximately 10 ftbg and consisted of a historic building foundation situated on western adjacent Lot 49. Sheeting along the western Site boundary was installed approximately 7 ft west, beyond the Site property boundary.

On June 5, 2014, a small waste oil tank was unearthed while excavating soil from grid 3A. The tank was approximately 50 to 75 gal in size and was intact with no holes or corrosion observed. The tank and surrounding soils were removed in one excavator bucket and staged on poly for disposal at a later date. On June 6, 2014, AARCO removed and disposed of the waste oil tank in accordance with applicable city, state and federal regulations (waste manifests are provided in Appendix D).

Integral collected a bottom confirmation sample (3A-WO-TANK-EP) from the area in which the tank was removed. Analytical results of the sample collected indicated the exceedence of one VOC above Unrestricted Use SCOs (total xylenes detected at 4.9 mg/kg, exceeding its Unrestricted SCO of 0.26 mg/kg); no exceedences of petroleum related SVOCs above Unrestricted Use SCOs; and concentrations of 5 SVOCs, consistent

with historic fill, were detected above Restricted Residential SCOs. All surrounding soils were excavated and disposed of as part of the Remedial Action.

The tank and confirmation sample locations and depths are depicted on Figure 3 Confirmation sampling results are provided in Table 6. The discovery and excavation of the tank was documented and submitted to the NYSDEC in the Weekly BCP Construction Report dated June, 2, 2014.

On June 18, 2014, while excavating soil in grid 1A, NYCC uncovered a 550-gallon UST. The tank was fully encased in concrete and full of water. On June 19, 2014, prior to excavation, AARCO removed approximately 400 gallons of liquid from the tank via a vacuum truck for containerizing the liquid/sediment and transporting it for proper disposal at a licensed facility (waste manifests are provided in Appendix D). Following complete removal of the tank contents, the empty tank was excavated, removed, photographed, and then loaded into AARCO's tri-axle truck for offsite disposal. No impacts to soil (staining or odors) were observed. No perforations or defects to the tank were identified. One bottom endpoint soil sample was collected from the UST excavation for laboratory analysis of VOCs and Base Neutral SVOCs. Analytical results of the sample collected indicated no VOCs or SVOCs were present above Unrestricted Use SCOs. Following endpoint sample collection, the excavation of grid 1A continued. All surrounding soils were excavated, sampled, classified, and disposed of as part of the Remedial Action.

UST and UST confirmation sample locations and depths are depicted on Figure 3. Confirmation sampling results are provided in Table 7. The discovery and excavation of the UST was documented and submitted to the NYSDEC in a Weekly BCP Construction Report dated June 16, 2014. Laboratory analytical reports for all pre-remedial sampling activities are provided in Appendix E with associated DUSRs included in Appendix F.

4.0 DESCRIPTION OF REMEDIAL ACTIONS PERFORMED

Remedial activities completed at the Site were conducted in accordance with the NYSDEC-approved RAWP for the 520 West 28th Street Site, dated December 23, 2013. All deviations from the RAWP are noted below.

4.1 GOVERNING DOCUMENTS

4.1.1 Health & Safety and Air Monitoring (HASP/CAMP)

All remedial work performed under this Remedial Action was in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA. All remedial activities were performed in accordance with the project Health and Safety Plan (HASP) provided as Appendix D of the RAWP (Integral, 2013). On-Site air monitoring was conducted consistent with the requirements of the community air monitoring plan (CAMP) and the project HASP. In accordance with the CAMP, air monitoring stations were established on the upwind and downwind corners of the excavation area. Each monitoring station was equipped with a PID to measure VOCs, and a Mini-Rae dust monitor equipped with a 10 microgram (µm) particulate filter to measure for particulate emissions less than 1.0 mg/m^3 in size (PM-10). Readings were collected approximately every 15 minutes during intrusive activities, and recorded. A portable PID was used to periodically monitor the work zone and for VOCs during activities such as soil sampling. Daily and weekly CAMP reports documenting CAMP readings were submitted to NYSDEC throughout the implementation of the Remedial Action.

The Site-specific action level for dust (20 mg/m^3) was based on the lowest calculated exposure limit of airborne dust containing inorganic contaminants that have established OSHA PELs with a safety factor of 4. The inorganic contaminant of concern with the lowest calculated exposure limit with the aforementioned criteria was lead. Dust meters were field checked (i.e., zeroed) daily in accordance with the manufacturer's specifications.

PID monitoring was also conducted within the work zone to monitor for potential exposure to workers and to satisfy the requirements of the HASP. The HASP established a PID action level of 5 ppm over background sustained for 1 minute. The PID was calibrated daily in accordance with the manufacturer's specifications. Calibration was conducted using 100 ppm isobutylene and zero gas (fresh air). Daily calibration data was recorded in the field logbook.

Each CAMP station was equipped with a visual alarm that flashed if the VOC or dust action level was exceeded. In order to reduce CAMP exceedences, dust control measures, including wetting down the excavation area and/or modifying work activities, were utilized.

Mr. Samuel McTavey served as the onsite Health and Safety Officer throughout the field program and reported directly to the Project Manager.

4.1.2 Quality Assurance Project Plan (QAPP)

The QAPP was included as Appendix E of the NYSDEC-approved RAWP. The QAPP describes the specific policies, objectives, organization, functional activities and quality assurance/ quality control activities designed to achieve the project data quality objectives.

4.1.3 Soil/Materials Management Plan

Soil and materials management onsite and offsite, including excavation, handling, importation, and disposal, was conducted in accordance with the Soil Materials Management Plan (SMMP), included as Appendix B of the NYSDEC-approved RAWP. Soil and sediment erosion controls, including the use of silt fences and tarps, were required considering the large volume of material that was excavated and removed from the Site. Steps were taken to ensure that trucks departing the Site did not track soil, fill or debris offsite to the extent practicable. Such actions included: the construction of truck wash pads (aggregate-based egress paths between the truck inspection station and the property exit) and the cleaning of truck tires and undercarriages. Measures were taken to ensure that adjacent roadways were kept clean of project related soils, fill, and debris.

4.1.4 Community Participation Plan

A Citizen Participation (CP) Plan was included as Appendix G of the NYSDEC-approved Remedial Investigation Work Plan (RIWP) (Integral, 2013). The CP Plan followed the NYSDEC's template for BCP Sites. As required for BCP Sites, copies of the BCP application, RI/IRM/RA Work Plans, including the HASP, CP and QAPP, for the Site were provided to the County of New York: New York Public Library, Muhlenberg Branch, 209 West 23rd Street, New York, NY for public review. BCP Application/RIWP Fact Sheets were prepared and mailed to the Department's approved Citizen Participation distribution list, after which all forthcoming fact sheets were placed in a Listserv and hardcopy mailing was discontinued.

Upon NYSDEC approval of the Final Engineering Report, a final Fact Sheet will

be prepared and distributed to announce that remediation has been completed and the Certificate of Completion (COC) has been issued.

4.2 REMEDIAL PROGRAM ELEMENTS

4.2.1 Contractors and Consultants

Integral served as the Engineer of Record. The following contractors also completed various tasks as noted:

- New York Concrete Corp. (NYCC): foundation contractor who performed the remedial excavation;
- Mueser Rutledge Consulting Engineers (MRCE): geotechnical engineer for the foundation and support of excavation design and waterproofing;
- DeSimone Consulting Engineers (DeSimone): structural engineer for the foundation design;
- Environmental Waste Minimization, Inc. (EWMI): environmental consultant for NYCC who oversaw the excavation and disposal of material at the Site and performed sampling efforts on behalf of disposal facilities;
- ARRCO: environmental contractor who performed the UST removals;
- Impact Environmental, Inc.: environmental consultant who performed waste characterization sampling at the Site;
- Aquifer Drilling and Testing Company (ADT): driller who performed waste characterization soil collection at the Site;
- Ground/Water Treatment & Technology, LLC (GWTT): consultant who designed the onsite dewatering system;
- Domani Inspection Services: consultant who performed vibration monitoring of Site adjacent buildings;
- Special Testing and Consulting, LLC: consultant who performed concrete testing for psi requirements;
- NAEVA Geophysics Inc. (NAEVA): geophysical consultant for GPR services;
- Mobile Dredging & Pumping Co.: Vac Truck contractor for dewatering

system;

- Geosyntec Consultants: consultant for the preparation of DUSRs;
- Alpha Analytical: analytical laboratory (ELAP #11148) for remedial/confirmation samples;
- Phoenix Environmental Laboratories, Inc.: analytical laboratory (ELAP #11301) for waste characterization samples; and
- TestAmerica Laboratories, Inc.: analytical laboratory (ELAP #11452) for waste characterization samples.

Transporters

- Cuenca Coronel Trucking Inc.;
- J&D Trucking, Inc.;
- Horwith Trucks, Inc; and
- Cardella Waste.

4.2.2 Site Preparation

On February 3, 2014, New York City Department of Environmental Protection (NYCDEP) approved the discharge of up to 72,000 gpd of groundwater from the Site (Appendix G). Prior to discharge the water was treated through one 8,000-gal settling tank, 5-micron bag filters, and two 1,000 pound carbon units.

Remedial mobilization commenced on March 10, 2014. Prior to intrusive activities, Dig Safe New York was notified and a pre-excavation utility clearance was requested for public underground utilities. Additionally, prior to remedial mobilization, NEAVA performed a geophysical survey on the property to identify any potential subsurface obstructions and/or private utilities.

Grubbing, Site clearing, and waste characterization sampling took place March 11-15, 2014. Remedial excavation began on March 17, 2014, and was performed through October 17, 2014. A construction fence and two project information signs (located on W27th and W28th Street) were erected prior to mobilization and remained in place during all phases of the Remedial Action.

Because the Site is less than 1 acre in area, a formal engineered Stormwater Pollution Prevention Plan (SWPPP) was not necessary. Soil erosion and sediment controls were utilized during remedial excavation and consisted of silt fences and poly

tarps. All stockpiles were placed on a layer of geofabric and 15-mil poly sheeting; 6-mil poly sheeting was placed on-top of the stockpiles at the end of each workday and anchored with large pieces of broken concrete. A double silt fence was erected around each stockpile.

Weekly meetings were held at the Site to review Site work progress, any changed conditions, proposed resolutions, data received, BCP requirements, and schedule. The meetings were typically attended by representatives of Related Construction, NYCC, MRCE, and Integral Engineering. NYSDEC visited the Site on May 1 and July 17, 2014. Additionally, Monthly Progress Reports were prepared as required by the brownfield cleanup agreement (BCA) to further summarize the progress of Site remediation activities. These reports were submitted to NYSDEC on a monthly basis. Copies of Monthly Progress Reports for March 2013 through October 2013 are presented in Appendix H.

On April 22, 2014, NYCC began construction of a truck wash by breaking portions of the concrete cap in the northwestern area of the Site adjacent to the construction entrance along West 28th Street. Once complete, the truck wash measured approximately 20-ft wide by 35-ft long. No truck or large piece of equipment was permitted to leave the Site until its tires and undercarriages had been cleaned of soils that may have accumulated on the vehicle while onsite. The truck wash was constructed as follows: one layer of geofabric, followed by 12 in of 4-in crushed clean stone, followed by another layer of geofabric, and finished with a 6-in layer of 4-in crushed clean stone. All waters generated from the truck wash were allowed to percolate into the Site subsurface with sediments trapped within the top layer of stone and fabric. Additionally, a 4-in hose was connected to a fire hydrant (located on West 28th Street) and was run through several reduced pressurized zone backflow prevention devices (RPZs) with a connection that controlled and diverted water throughout the Site for tire washing and dust suppression.

Documentation of agency approvals required by the RAWP is included in Appendix C. Other non-agency permits relating to the remediation project are provided in Appendix G.

4.2.3 General Site Controls

A construction office trailer was established on a neighboring vacant tax lot owned by The Related Companies. All visitors were required to undergo safety orientation and to sign in at the office before proceeding onsite. Access to the Site was

restricted and general Site security was maintained through perimeter fencing and the establishment of two secured access gates to the Site; one at the West 28th Street entrance and one at the West 27th Street entrance. Both gates were manned with dedicated security personnel at times when the gates were not locked. Additionally, two cameras were mounted on the roof of the building located to the north of the Site, across West 28th Street. One camera monitored all Site activities, while the other camera took a high definition photograph of the Site every 15 minutes. Site security incidents were not encountered during implementation of the Remedial Action.

All project records were available onsite in the construction office trailer and online through E-Builder during all phases of the Remedial Action. A PID was used to monitor VOC levels up and downwind of the Site as per the CAMP. All excavation work was overseen by an Integral scientist. Integral personnel kept track of daily activities, onsite visitors, contractors and any deviations (none noted) from the RAWP as related to the remedial activities.

The excavation of the Site was phased from east to west, which resulted in the stockpiling of some soils. When soil could not be live-loaded on to trucks, soil was stockpiled within its respective waste characterization grid for disposal at a later date. As discussed in Section 4.2.2., stockpiled soil was staged on geofrabic, covered with poly sheeting, and anchored with rocks or broken concrete.

4.2.4 Nuisance controls

Nuisance controls associated with soil excavation work at the Site generally consisted of the following: dust and odor control; truck routing and egress housekeeping; responding to complaints; and truck washing.

Dust control was performed as discussed below in Section 4.2.5 and all data relating to these efforts is provided in Appendix I . To limit odors from the Site, the following activities were performed:

- Limiting the size of soil stockpiles;
- Direct loading of trucks; and
- Monitoring for odors at the boundaries of excavation work areas.

All trucks loaded with Site materials exited the vicinity of the Site via the following truck route: trucks exited the Site onto West 27th Street and headed west towards 11th Avenue. The trucks continued onto Route 9A, after which State highways interstate roadways were predominantly utilized thereafter to the final destination. The

direction was reversed returning to the Site.

The above routing took into account the following factors: (a) limiting transport through residential areas and past sensitive Sites; (b) use of mapped truck routes; (c) minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Egress housekeeping associated with truck traffic consisted of the construction of a truck wash station and the use of street sweepers to sweep and collect minor soil material left behind as a result of the transportation activities. Street sweeping adjacent to the Site entrance was also performed to collect soil material left behind as service vehicles demobilized the Site.

No nuisance complaints from the public were received during Remedial Action activities.

4.2.5 CAMP results

The CAMP was developed in accordance with the New York State Department of Health (NYSDOH) Generic CAMP and OSHA standards for construction (29 CFR 1926). Remedial activities were monitored for dust and odors by the Remedial Engineer's field inspector. Continuous monitoring at the perimeter of the Site for dust and VOCs was conducted during all ground intrusive activities, Site remediation operations, and material handling activities. Two stationary air monitoring stations were established at the northeast and southwest corners of the Site (one upwind and one downwind). Each station was equipped with a PID (MiniRAE-2000) and a DustTrak II aerosol monitor (Model 8530), which were contained within a fiberglass enclosure and equipped with a visual alarm system. The visual alarms were set to flash if VOCs or duct exceeded the action levels set forth in the HASP/CAMP, for the protection of the community and visitors.

The PM-10 level exceeded the 1.0 mg/m^3 action level sporadically throughout implementation of the Remedial Action. Work performed by NYCC (e.g., material excavation and SOE construction) that caused excursions were quickly modified to reduce these levels as they occurred. The majority of the excursions were mitigated with the spraying of water until visible dust was under control and no longer leaving the Site.

Minor excursions above the established PID action level of 5 ppm sustained for 15 minutes at the northeast and southwest stations were noted sporadically during remedial activities. The majority of these occurrences were either related to a faulty

calibration, or a localized, short term condition not reflective of onsite soil conditions including: use of aerosol (spray paint) and/or welding products proximate to the PIDs. All excursions were short-term localized events that were resolved by the cessation of work associated with the excursion or instrument re-calibration.

During excavation and soil sampling activities, a PID was used by the field inspector to screen ambient air quality of excavation areas, sidewalls, and stockpiles. Occasional VOC vapors were detected by the equipment within soil excavation areas; however, these vapors were only detected upon direct application of the PID into the surrounding soil. No excursions of VOCs above the 5 ppm in ambient air were noted. In addition, no odors or impacted areas were noted that were indicative of a release.

Copies of all field data sheets relating to the CAMP are provided in electronic format in Appendix I.

4.2.6 Reporting

Daily CAMP reports were prepared by Integral's onsite field scientist and submitted daily to NYSDEC;

Weekly construction progress reports (with daily photo logs) were prepared by Integral's onsite field scientist and submitted weekly to NYSDEC; and

Monthly BCP Progress Reports were prepared by Integral's project manager and submitted to NYSDEC on the 10th of every month during the performance of the Remedial Action.

All daily, weekly and monthly reports are included in electronic format in Appendices I, J, and H, respectively.

Digital photo logs are included in the weekly construction progress reports (included in Appendix J). Additionally, a battered secant pile photo log is included in electronic format in Appendix K.

4.3 REMEDIAL ACTIONS

4.3.1 Secant and battered secant pile wall

4.3.1.1 Southern Site Boundary SOE (Secant Pile Wall)

The SOE design for the southern Site boundary adjacent to five buildings fronting West 27th Street is as follows: drilled secant piles encroached approximately 16" into the southern adjacent property lines of Lots 26, 25, 24, and 22, with the scallops of the secant

piles intersecting 5/8" into the southern adjacent property line (Drawing SK-2). The secant pile wall was drilled directly through the guide wall and sheeted pits and terminated approximately 2 ft into bedrock. The building located on Lot 23 is the only building along the southern Site boundary whose structure was built to its property boundary. All other southern adjacent buildings do not extend to their respective property lines. Thus, the only area along the southern Site boundary where the secant wall did not encroach into a neighbor's lot is along Lot 23. In order to remove all soil within the Site's lot line along Lot 23 and without compromising the structural integrity of the building on the Lot, an alternate means of excavation was employed.

Earlier test pits performed by Mueser Rutledge Consulting Engineers (MRCE), indicated the presence of a partial former building foundation consisting of an approximately 3-ft high brick wall and 6-in. thick concrete spread footing below the contemporary building foundation on Lot 23. NYCC removed the brick wall and saw cut approximately 9 in. off of the footing to clear for the installation of the secant pile guide wall.

On March 10, 2014, a pre-design/pre-excavation soil boring (D3-EP) was advanced behind and directly against the building on Lot 23. This soil boring was sampled in one 1-ft intervals from 8- to 15-ftbg in order to inform the depths at which the alternate SOE needed to be designed to meet Unrestricted Use SCOs. Field observations indicated that native soil in this area was present at approximately 7 ftbg. Laboratory analysis of pre-excavation endpoint sample D3-EP (8- to 9-ft) indicated that soil from 8-9-ft below grade met Unrestricted Use SCOs. Pre-design sample results are summarized in Tables 2 and 3.

In order to remove all of the soil within the Site boundary along Lot 23, MRCE designed a combination of hand dug sheeted pits and secant piles. A total of seven sheeted pits were constructed along the southern Site boundary adjacent to Lot 23 and designated A-F. Prior to sheeted pit installation, a 3.5-ft deep trench was excavated along the Site boundary adjacent to Lot 23 to expose the adjacent building foundation. Sheeted pit installation occurred beneath the adjacent building foundation at 3.5 ftbg. All soil within each sheeted pit was hand dug to a depth of 8.5-9.5 ftbg and to the Site boundary or 1- to 2-in. past the Site boundary. The installation of sheeted pits along the Lot 23 boundary was successful in removing all soil from under the concrete foundation to the property line. Following soil removal, the sheeted pits were filled with flowable fill (concrete), which was a structural underpin for the neighboring foundation and allowed NYCC to properly install its guide wall. Drawing SK-1 details the excavation procedure.

MRCE was onsite to observe secant drilling operations to ensure proper installation methods were achieved.

4.3.1.2 Eastern Site Boundary Adjacent to Lot 22 SOE (Battered Secant Pile Wall)

The western wall of the building located on Lot 22 extends to the Site property boundary; in order to remove all soil within the Site's boundary, a total of 25 sheeted pits were constructed along the eastern Site boundary adjacent to Lot 22. Pre-trenching was performed along the eastern Site boundary adjacent to Lot 22 to expose the adjacent building foundation and to prepare for the installation of sheeted pits. Upon completion of the trench, MRCE marked out the location of 25 sheeted pits which were designated sheeted pit #1 through #23; two additional pits were was designated sheeted pit A and B (pits A and B were located at the northwest corner of the building on Lot 22). Sheeted pit installation occurred beneath the adjacent building foundation, which was encountered at varying depths ranging from 5 to 9 ftbg. All soil within each sheeted pit was removed to approximately 11 ftbg (elevation 0) and an average of 6 in. east and into the property line of Lot 22. Soil within the sheeted pits was excavated utilizing both an excavator and manual hand digging methods to a depth at which the water table was encountered (approximately 10.5 ftbg). Once the water table was encountered a sump was dug to a lower elevation on one side of the pit, filled with ¾-in. gravel stone, and an operational submersible pump installed. The pump discharged excess waters and sediment through a hose to either an 8,000 gal frac tank, or to the surface at a location approximately 30 ft away from the pit and allowed to percolate into the Site subsurface. Following soil removal to elevation 0, the sheeted pits were filled with flowable fill (concrete), which acted as a structural underpin for the neighboring foundation and allowed NYCC to properly install its secant pile guide wall. Sheeted pit installation was staggered due to concrete curing times and foundation structural integrity concerns on Lot 22. In addition to the guide wall, NYCC also installed a guide bar at elevation +12 (approximately 1 ft above the guide wall) along the western façade of the building on Lot 22. The guide bar was used to ensure that the secant pile casing was the proper distance (9 ¾ in.) from the Site property line while maintaining a pre-designed drilling angle of 6 degrees. All elevations and property line demarcations were surveyed and verified by NYCLS.

Secant piles were drilled directly through the guide wall and sheeted pits and terminated several feet into bedrock. Secant piles along this Site boundary were installed at a 6 degree angle (battered) so that the scallop of the pile intersected the adjacent property boundary at elevation 0. This SOE design allows for the removal of all of the soil within the Site boundary (along the western wall of Lot 22 above elevation 0) and

leaves the remaining onsite soil below elevation 0 accessible for removal during remedial excavation. Drawing SK-7 details the battered secant SOE design. Assembly of the guide wall form and subsequent secant pile concrete guide wall was constructed so that the center line of the styrofoam secant molds are 2 ft, 2 in. west of the property line. The guide wall was constructed to aid the proper advancement of the battered secant pile.

In order to establish and confirm the angle of pile installation, MRCE designed a triangular plywood jig with a 6 degree angle built in. This jig was used by NYCC to confirm the proper tilt of the secant pile casing during installation. Prior to advancement of the pile, the casing was tilted at a 6 degree angle and the jig was held plumb against the eastern face of the casing; a standard bubble level was used to confirm the angle of the tilt. For quality assurance during secant pile installation, casings tilt angle measurements were verified prior to initial advancement, at elevation +5 and at elevation 0. The angle of the casing was assessed and documented at each aforementioned elevation by both MRCE and Integral in order to confirm proper installation. A battered secant pile log was maintained and all battered secant pile angles were signed off by MRCE, NYCC, and Integral (Appendix K). Additionally, all measurements for each battered secant pile were photo documented and are included in Appendix K.

4.3.2 Contaminated Materials Removal

In order to achieve Track 1 Unrestricted SCOs, soil removal extended outside of the northern, southern, eastern, and western Site boundaries and to a minimum depth of 15 ftbg over the entire Site, with the majority of the excavation extending 18 ftbg into native material and/or into bedrock. Surveyed measurements were taken to document the placement of sheeting outside the property boundary. Sheeting was installed along the eastern Site boundary adjacent to Lot 42, between 1 ft and 3 ft east of the property boundary. Along the northern Site boundary adjacent to West 28th Street, sheeting was installed approximately 4 ft north of the Site boundary, except at the northeast corner where a vault was encountered. Sheeting around the vault was installed approximately 18 in. north of the Site boundary. Sheeting along the western Site boundary adjacent to Lot 49, was installed between 6 ft and 7 ft west of the property boundary. Sheeting along the southern Site boundary adjacent to West 27th Street, was installed approximately 4 ft south of the property boundary, except in the southwestern corner, where a vault was present. Sheeting around the vault was installed between 6 in. and 12 in. south of the property boundary. Perimeter sheeting extended into bedrock and was tied into the secant pile wall at both southeastern corners at Lot 42 and Lot 22. Offsite sidewall soil samples were collected during the installation of sheeting in accordance with NYSDEC-

DER protocol and the NYSDEC-approved RAWP.

In areas where bedrock was deeper than the final excavation depth, excavation endpoint samples were collected to verify that Unrestricted Use SCOs had been achieved. Endpoint sample locations are depicted on Figure 5. An extent of excavation drawing is included as Figure 6. A list of the Track 1 Unrestricted SCOs for the contaminants of concern for this project is provided in Table 1. The results of bottom endpoint and offsite sidewall samples are discussed in Section 4.4 of this Report.

4.3.2.1 Soil Disposal Details

Prior to the start of remedial excavation, NYCC contracted EWMI and Impact to characterize the onsite soil for disposal. A Field Sampling Plan (FSP) was developed by EWMI/Impact, which outlined the proposed methodology for waste characterization sampling. Integral reviewed and provided comment on EWMI's FSP. On March 12–14, 2014 Impact performed waste characterization sampling in accordance with their previously submitted and approved FSP dated March 6, 2014 (Appendix L). Aquifer Drilling and Testing (ADT) was the driller onsite advancing soil borings utilizing a hydraulic-powered, track-mounted Geoprobe. The Site was divided into 12 horizontal grids and four vertical layers, resulting in a total of 48 individual ~900 ft^2 cubes. Each horizontal grid was designated with a number (1-12) and each vertical layer was designated with a letter (A-D). A total of 42 discrete grab samples and 42 grid composite samples were collected by Impact in order to characterize the soil for disposal. All samples were sent to Phoenix Environmental Laboratories, Inc. (Phoenix) where they were analyzed for the following parameters:

- Total VOCs via USEPA Method 8260;
- Total SVOCs via USEPA Method 8270;
- Total Polychlorinated Biphenyls (PCBs) via USEPA Method 8082;
- Pesticides via USEPA Method 8081;
- Herbicides via USEPA Method 8151;
- Total Metals via USEPA Method 6010;
- Total Cyanide via USEPA Method 9012A;
- Total Mercury via USEPA Method 7470/7471
- Hexavalent Chromium via USEPA Method 7196A/3060A

- TCLP Metals via USEPA Method 1311/6010

Following the receipt of laboratory analytical results, four categories of onsite waste were identified: 1) Lead Hazardous Waste; 2) Non-Hazardous Landfill; 3) New Jersey Non-Residential Modified (NJ Non-Res Modified); and 4) New Jersey Residential (NJ Res). On March 26, 2014, Integral obtained an EPA ID number of NYR000208587 for the disposal of lead hazardous waste. The hazardous waste permit application and EPA acknowledgement letter are provided in Appendix M. As described in Section 3.3 of this Report, on May 30, 2014, odorous soil was encountered during pre-trenching along the western Site boundary for sheeting installation. Both Integral and EWMI collected a sample of the odorous soil. Integral's sample was analyzed for VOCs and SVOCs, while EWMI's sample was analyzed for total lead. EWMI's sample results indicated elevated concentrations of lead, which resulted in the re-classification of approximately 250 tons of soil. This soil was not characteristically hazardous, but the total lead concentration was higher than the approved disposal facilities would accept. Consequently, this soil was designated for disposal at a Pennsylvania Department of Environmental Protection (PADEP) facility.

A Field Sampling Summary Report (FSR) and Soil Excavation Plan (SEP) were prepared by EWMI based on the results of the waste characterization sampling and potential disposal facilities were identified. The table below identifies the soil disposal categories and their associated grid locations as determined by EWMI. Figures 3–6 of the FSR, provided as Appendix N, depict the waste characterization grids and sampling locations.

Waste Characterization	Grid Locations
Hazardous Waste	4A, 5A, 8A, and 11A
Non-Hazardous Landfill	3A, 7A, 12A
NJ Non-Residential	1A, 2A, 6A, 9A, 10A, 2B, 3B, 7B, 8B, 11B, 12B, 11C, 12C
NJ Residential	1B, 4B, 5B, 6B, 9B, 10B, 1-10C, 1-3D, 6D, 11D, 12D
PADEP Classified	12A
Concrete	Site Cap Material

A summary of the waste characterization sampling and analytical results is included as Table 8.

Prior to facility approval, a signed generator profile package was submitted to each facility summarizing the waste characterization findings and specific grids for acceptance. Upon facility approval of the package, a written approval letter was issued and transport soils offsite began. Generator profile letters to disposal facility owners and facility acceptance letters are included in Appendix O. Disposal facilities utilized for this project and their transporters are summarized below:

Approved Facility	Address	Accepted Material	Transporter	Waste Transporter Permit NO.
Morris Fairmount Associates Urban Renewal LLC	Blanchard Avenue Newark, NJ 07105	NJ-Non Residential Modified	Cuenca Coronel Trucking, Inc.	NJ-850
PPark, LLC	100 Panten Avenue Prospect Park, NJ 07580	NJ Residential	Cuenca Coronel Trucking, Inc.	NJ-850
Impact Reuse & Recovery Center	1000 Page Avenue Lyndhurst, NJ 07071	Concrete	Cuenca Coronel Trucking, Inc.	NJ-850
Republic Environmental Systems (PA), Inc.	2869 Sandstone Drive, Harfield, PA 19440	Hazardous Waste	Horwith Trucks, Inc	PA-263
Clean Earth of North Jersey, Inc.	105 Jacobus Avenue, Kearny, NJ 07032	Hazardous Waste	J&D Trucking, Inc.	NJ-471
Westside Transload, LLC	5600 Westside Transload, North Bergen, NJ 07047	Non-Hazardous Landfill	Cardella Trucking CO., Inc.	NJ-851
Tunnel Hill Reclamation, LLC	2500 Township Road 205, Route 2, New Lexington, OH 43764	Non-Hazardous Landfill	Soil Transported by Rail from Westside Transload, LLC	N/A
Phase III Environmental, LLC (Former NJ Zinc Facility)	1120 Mauch Chunk Road, Palmerton, PA 18071	Pennsylvania Department of Environmental Protection (PADEP) Regulated Fill	Cuenca Coronel Trucking, Inc.	NJ-850

All characterized Site material was excavated during SOE and foundation construction activities between March 19 and October 15, 2014. Manifests and bills of lading are included in electronic format in Appendix P. Care was taken during remedial excavation not to mix soils of different disposal classification and to maintain soil stockpiles within their respective classified grids. Contour maps of estimated cut and fill thicknesses for remedial activities have not been included, as the entire Site was excavated to Unrestricted Use SCOs or bedrock with no importation of backfill.

The table below summarizes the total quantities of each categorized material removed from the Site along with the corresponding grid locations. A summary of daily load out activities to disposal facilities has been included as Table 9.

Waste Characterization	Quantity Excavated (tons)	Grid Locations
Hazardous Waste	3,984.15	4A, 5A, 8A, and 11A
Non-Hazardous Landfill	1,495.65	3A, 7A, 12A
NJ Non-Residential	13,899.26	1A, 2A, 6A, 9A, 10A, 2B, 3B, 7B, 8B, 11B, 12B, 11C, 12C
NJ Residential	14,322.60	1B, 4B, 5B, 6B, 9B, 10B, 1-10C, 1-3D, 6D, 11D, 12D
PADEP Classified	249.54	Portions of 1B, 1C, 6B, 6C
Concrete	1,442.91	Site Cap Material

The total volume of soil and concrete cap material removed from the Site as part of the Remedial Action for this Track 1 Cleanup was approximately 35,394.11 tons. Figure 6 depicts the extent of excavation. Waste hauler permits are included as Appendix Q.

4.3.2.2 UST Soil and Water Disposal Details

Section 3.3 of this Report details the removal of the three previously unknown USTs discovered onsite during remedial excavation activities. The results of the endpoint samples collected as part of the documentation of the UST removals were discussed in Section 3.3. Analytical results of the soils collected surrounding each UST did not substantially deviate from EWMI's waste characterizations profile and were therefore disposed of accordance with EWMI's FSSR. Disposal of USTs and non-hazardous waste water was completed by AARCO. UST disposal receipts and manifests

for non-hazardous water disposal are included in Appendix D.

4.3.2.3 Groundwater Discharge Disposal Details

Groundwater was present onsite at approximately 10 ftbg. In order to control infiltrating groundwater during the SOE installation, several dewatering points were placed around the Site. Dewatering points installed by NYCC consisted of a sump pump designed to collect pooling groundwater in either a pit or screened corrugated pipe, and discharge the groundwater via 2-in. and 4-in. hoses. All discharged groundwater from these points was plumbed to an onsite 2,000-gal capacity frac tank and then filtered by a treatment system designed by Groundwater Treatment and Technology (GWTT). The system consisted of two bag filters, and two granulated activated carbon (GAC) canisters, with a point of discharge to the combined sewer beneath West 28th Street. Quarterly discharge effluent samples were collected by GWTT and the results are included in Appendix R. The results of quarterly effluent sampling indicate that groundwater collected from the Site meets the Technical Operational Guidance Series (TOGS) Ambient Water Quality Standards (AWQS).

4.3.2.4 Frac Tank Soil Disposal Details

Throughout the duration of dewatering activities the frac tank was emptied three times by Mobile Dredging and Pumping Co., of Chester Pennsylvania. All soil fines collected in the frac tank were representative of soils encountered below the water table. As per EWMI's waste characterization report the soils below the water table were categorized as either NJ Non-Res Modified or NJ Residential. As a default, frac tank soil fines were characterized for disposal as NJ Non-Res Modified. Soil fines were removed from the frac tank via vacuum extraction and containerized within a vactor truck. Following removal, soil fines were depositing back onto the Site into previously characterized NJ Non-Res Modified grids and allowed to dry prior to disposal at an approved facility.

4.3.2.5 On-Site Reuse

All soils above Unrestricted Use SCOs were disposed of in accordance with the approved plans and not reused onsite for any purpose. Bedrock encountered during remedial excavation above final excavation elevations was broken up (chopped) to designed elevations. Chopped bedrock was stockpiled onsite and segregated from characterized soils. Onsite reuse of chopped bedrock was approved by NYSDEC via email on August 21, 2014. Chopped bedrock was reused a sub-base for foundation construction activities. In areas where the Site was over excavated, chopped bedrock was

used to build up the excavation to final design elevation. Figure 6 depicts the extent of onsite excavation. Figure 7 depicts the areas where chopped bedrock was reused.

4.3.3 Spill Closure

During the performance of the onsite Remedial Investigation[1] (RI), Integral observed approximately 1/8 in. of what appeared to be nonaqueous-phase liquid (NAPL) in monitoring well MW-1. As a result, a petroleum spill was reported to the NYSDEC and Spill No. 1300765 was assigned to the Site. MW-1 was previously installed by ELM Engineering, P.C. (renamed Integral Engineering, P.C.) during the implementation of a Supplemental Site Investigation (SSI) in August 2012. At the time of installation, no impacts to groundwater or soil were observed in the field and no petroleum related VOCs were detected in soil or groundwater samples collected from this location during the SSI.

Laboratory analysis of the NAPL collected from MW-1 during the performance of the RI indicated the following: Gasoline range organics (GRO) was detected at a concentration of 10,000 µg/kg and total petroleum hydrocarbons (TPH) was detected at 773,000 µg/kg. A forensic fingerprint analysis of the sample was performed by Alpha Analytical Laboratory of Westborough, MA, NYSDOH ELAP #11148. The data generated and the qualitative information assessed from the chromatographic pattern recognition and boiling point ranges, indicated that the material is similar in nature to lubricating, motor or synthetic oil-like product. The GC-FID Chromatogram suggests motor oil.

On June 21, 2013, a permanent groundwater monitoring well (MW-6) was installed in the sidewalk along 27th Street, approximately 75 ft downgradient of the onsite USTs. This well was installed during the offsite phase of work in order to further evaluate the conditions that led to the reporting of the petroleum release. Integral gauged the MW-6 on July 2 and observed approximately 1 in. of what appeared to be NAPL; which appeared to be consistent with the NAPL observed in MW-1 in April 2013.

An Interim Remedial Measure (IRM) Work Plan was submitted to, and approved by, NYSDEC in July 2013. The purpose of the IRM was to excavate and properly decommission two 550-gallon USTs located in the southwestern portion of the Site approximately 25 ft upgradient of MW-1, which could have been the source of the NAPL discovered in MW-1. On July 30, Integral placed absorbent socks in both wells. The placement of the socks served a dual purpose: 1) to remove the existing NAPL in both

[1] The RI was approved by NYSDEC on March 21, 2013 and implemented in April 2013.

wells in order to facilitate their sampling, and; 2) to evaluate whether the NAPL would return after its initial removal. On July 31, 2013, Integral removed the socks from both wells and collected groundwater samples for analysis of VOCs, SVOCs, and total metals. Groundwater analytical results from both wells indicated that the presence of NAPL has not impacted groundwater on or offsite.

As discussed in Section 3.3 of this Report, on August 1, 2013, Integral implemented a NYSDEC approved IRM at the Site and oversaw the excavation and decommissioning of both onsite USTs. Both tanks were previously utilized for the containment of gasoline. Therefore, they were not the source of the NAPL found in onsite well (MW-1) and offsite well (MW-6). The results of the IRM were documented in an Addendum to the RIR, dated December 6, 2013.

Integral continued to monitor the occurrence of NAPL in wells MW-1 and MW-6 from July 2013 through the completion of the Remedial Action. Absorbent sock cycling continued in an effort to eliminate the presence of NAPL or mitigate a potential continuing source. Between August 1, 2013 and October 4, 2013, NAPL in MW-1 was gauged at variable thicknesses ranging from non-measurable to 0.06 ft. From October 4, 2013 to June 6, 2014, no detectable thickness of product was noted in MW-1. From August 1, 2013 through July 2014, NAPL in MW-6 was gauged at varying thicknesses ranging from non-measurable to 0.97 ft.

MW-1 was decommissioned in June 2014 following proximal sheeting installation and remedial excavation. Anchoring of the perimeter SOE into bedrock effectively created a bathtub isolating the Site from the water table and accordingly, subsurface groundwater flow. MW-6 was gauged three more times after the installation of the sheeting and material excavation at the southern portion of the Site. Each time MW-6 was gauged the thickness of NALP had increased, with the most recent gauging (November 3, 2014) resulting in the thickest measurable NAPL recorded to date (2.62 ft).

No petroleum impacted soil or groundwater was observed during remedial excavation of the soils in the vicinity of MW-1 or the remaining portions of the UST vault (i.e., no onsite NAPL source was identified). Results of MW-6 NAPL gauging after the Site was excavated and sheeting was installed to bedrock indicate a continuing unknown offsite source of NAPL. Based on the aforementioned, Integral concludes that the petroleum release associated with Spill No. 1300765 did not originate from the Site and recommends that the spill case be closed or reassigned to a different address.

Table 10 summarizes the findings of the gauging and provides additional detail on

absorbent sock installation and replacement.

4.4 REMEDIAL PERFORMANCE/DOCUMENTATION SAMPLING

Per NYSDEC-DER policy and in accordance with the NYSDEC-approved RAWP, confirmation soil samples were collected above the groundwater table from each excavation sidewall, for every 30 linear ft of sidewall. Sidewall samples were collected outside of the property boundary to document offsite soil conditions, as all soil within the property boundary was removed during the implementation of the Remedial Action. Sidewalls were continuously logged and screened with a PID from grade to the bottom of the trench depth. Soil samples were collected with a bias toward the area of highest suspected impact or from the deepest interval excavated above the groundwater interface. In addition to the collection of sidewall samples, excavation bottom samples were collected at a rate of one sample per every 900 ft^2. Bottom endpoint samples were not collected in areas where the excavation extended into bedrock.

Soil samples selected for laboratory analysis were placed in laboratory supplied containers, sealed and labeled, and placed in a cooler and chilled to 4^oC for transport under chain-of-custody procedures. QA/QC samples were collected in accordance with the NYSDEC-approved Quality Assurance Project Plan (QAPP) provided as Appendix E of the RAWP. Soil samples were submitted to a NYSDOH ELAP-certified laboratory via courier service and analyzed for the following parameters:

- TCL VOCs via EPA Method 8260C;
- TCL SVOCs via EPA Method 8270D;
- Target Analyte List (TAL) Metals via EPA Method 6010C/7471B;
- Pesticides via EPA 8081B; and
- PCBs via EPA Method 8082A.

4.4.1 Offsite Sidewall Soil Sampling

Offsite sidewall samples were collected along the northern, eastern, southern, and western Site boundaries during the installation of the SOE. Sidewall samples collected along the southern Site boundary adjacent to Lots 22, 23, 24, 25, and 26, and the eastern Site boundary adjacent to Lot 22 were collected beneath existing building foundations. Offsite sidewall samples collected along the remainder of the Site boundaries were collected during pre-trenching for sheeting installation. Surveyed measurements were

taken to document the placement of sheeting outside the property boundary. As discussed in Section 4.3.2 of this Report, sheeting was installed along the eastern Site boundary adjacent to Lot 42, between 1 and 3 ft east of and beyond the property boundary. Along the northern Site boundary adjacent to West 28th Street, sheeting was installed approximately 4 ft north of and beyond the Site boundary, the only exception being the northeast corner where a vault was encountered. Sheeting around the vault was installed approximately 18 in. north of and beyond the Site boundary. Sheeting along the western Site boundary adjacent to Lot 49, was installed between 6 and 7 ft west of and beyond the property boundary. Sheeting along the southern Site boundary adjacent to West 27th Street, was installed approximately 4 ft south of the property boundary, except in the southwestern corner, where a vault was present. Sheeting around the vault was installed between 6 and 12 in. south of and beyond the property boundary. Perimeter sheeting extended into bedrock and was tied into the secant pile wall at both southeastern corners at Lot 42 and Lot 22.

Sidewalls were continuously logged and screened with a PID from grade to the bottom of the trench depth. Soil samples were collected with a bias toward the area of highest suspected impact or from the deepest interval excavated above the groundwater interface. Below is a description of all offsite soil samples collected during the Remedial Action.

On March 25, 2014, Integral collected two sidewall samples (D3-SW and D6-SW) to document offsite soil conditions along the southern Site boundary prior to the installation of guide wall forms. D3-SW was collected 12 in. and D6-SW was collected 10 in. south of the southern Site boundary. A detailed description of the samples collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
D3-SW(8.5′)	8.5	0	SAND; medium; dark brown mottled with light brown; moist; medium; no odor.
D6-SW(2.5′)	2.5	0	FILL (coal ash, concrete, brick, metal); SAND; medium; trace SILT and GRAVEL (medium, sub-round); brown/black; damp; no odor.
Trip Blank	N/A	N/A	QA/QC Sample

On March 26, 2014, Integral collected two sidewall samples (D5-SW and D4-SW) to document offsite soil conditions to the south prior to the installation of sheeted pits along the southern Site boundary. D5-SW was collected 21 in. and D4-SW was

collected 20 in. south of the southern Site boundary. A detailed description of the samples collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
D5-SW(4.5′)	4.5	0	SAND; medium; dark brown; medium; damp; no odor; some SILT and FILL (coal ash, glass, brick, metal, concrete).
D4-SW(3.5′)	3.5	0	SAND; medium; dark brown; medium; damp; no odor some SILT and FILL (coal ash, brick, concrete metal).
Trip Blank	N/A	N/A	QA/QC Sample

On April 7, 2014, Integral collected two sidewall samples (D2-SW and F2-SW) to document offsite soil conditions to the east prior to the installation of sheeted pits adjacent to Lot 22. Both samples were was collected 2 in. east of the eastern Site boundary. A detailed description of the samples collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
D2-SW(3.5′)	3.5	0	SAND; medium; light brown; moist; medium; no odor; some GRAVEL (medium, sub-round) and DEBRIS (glass, ash, brick).
F2-SW(4.5′)	4.5	0	FILL (brick, metal, glass, ash); SAND; medium; brown/black; damp; no odor; some GRAVEL (medium, sub-round);
Trip Blank	N/A	N/A	QA/QC Sample

On April 14, 2014, Integral collected one sidewall sample (G2-SW) to document offsite soil conditions to the east prior to the installation sheeted pits adjacent to Lot 22. G2-SW was collected 8 in. east of the eastern Site boundary. A detailed description of the sample collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
G2-SW(8′)	8	0	SAND; medium; light brown; moist/wet; no odor; some SILT; trace GRAVEL (medium, sub-round).
Trip Blank	N/A	N/A	QA/QC Sample

On April 14, 2014, Integral collected three sidewall samples (B6-SW, C6-SW, and D6-SW) to document offsite soil conditions to the east during trenching activities

adjacent to Lot 42. B6-SW and C6-SW were collected 2 ft east of the eastern Site boundary; and D6-W was collected 1 ft east of the eastern Site boundary. A detailed description of the samples collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
B6-SW(3′)	3	0	SAND; medium; light brown; damp; medium; no odor; some GRAVEL (medium, sub-round) and FILL (brick, ash, metal).
C6-SW(2.5′)	2.5	0	FILL (brick, asphalt, metal, glass) and ASH (black); damp; faint odor; some SAND; medium; brown/black; damp; no odor; some GRAVEL (medium, sub-round); trace fine SAND.
D6-SW(2′)	2	0	SAND; medium; dark brown; damp; medium; no odor; some GRAVEL (medium, sub-round), DEBRIS (asphalt), and SILT.
Trip Blank	N/A	N/A	QA/QC Sample

On May 1, 2014, Integral collected one sidewall sample (A6-SW) to document offsite soil conditions to the east during trenching activities adjacent to Lot 42. A6-SW was collected 2.5 ft east of the eastern Site boundary. A detailed description of the sample collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
A6-SW(3′)	3	0	SAND; medium; light brown; damp; medium; no odor; some GRAVEL (medium, sub-round) and FILL (brick, ash, metal).
Trip Blank	N/A	N/A	QA/QC Sample

On May 7, 2014, Integral collected one sidewall sample (A5-SW) to document offsite soil conditions to north during pre-trenching activities adjacent to West 28th Street. A5-SW was collected 2 ft north of the northern Site boundary. A detailed description of the sample collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
A5-SW(9.5′)	9.5	0	SAND; medium; light brown; wet; medium; no odor; some MICA and trace GRAVEL (medium, sub-round).
Duplicate	N/A	0	QA/QC Sample

Trip Blank	N/A	N/A	QA/QC Sample

On May 13, 2014, Integral collected one sidewall sample (A4-SW) to document offsite soil conditions to the north during pre-trenching activities adjacent to West 28th Street. A4-SW was collected 2 ft north of the northern Site boundary. A detailed description of the sample collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
A4-SW(8′)	8	0	SAND; medium; light brown; moist; medium; no odor; some MICA and trace GRAVEL (medium, sub-round).
A4-SW(8′) MS	8	0	QA/QC Sample
A4-SW(8′) MSD	8	0	QA/QC Sample
Trip Blank	N/A	N/A	QA/QC Sample

On May 14, 2014, Integral collected two sidewall samples (A2-SW and A3-SW) to document offsite soil conditions to the north during pre-trenching activities adjacent to West 28th Street. A2-SW and A3-SW were collected 3 ft north of the northern Site boundary. A detailed description of the samples collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
A2-SW(7′)	7	0	SAND; medium/fine; brown; damp; no odor; trace GRAVEL (medium, sub-round).
A3-SW(6′)	6	0	SAND; medium/fine; light brown; moist; medium; no odor; trace GRAVEL (medium, sub-round) and MICA.
Trip Blank	N/A	N/A	QA/QC Sample

On May 19, 2014, Integral collected one sidewall sample (A1-SW) to document offsite soil conditions to the north during pre-trenching activities adjacent to West 28th Street. A1-SW was collected 3 ft north of the northern Site boundary. A detailed description of the sample collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description

A1-SW (5′)	5	0	SANDY SILT; medium; brown; moist; no odor; trace GRAVEL (medium, sub-round).
Trip Blank	N/A	N/A	QA/QC Sample
N/A = Not Applicable QA/QC = Quality Assurance and Quality Control			

On May 20, 2014, Integral collected one sidewall sample (A1-WEST-SW) to document offsite soil conditions to the west during pre-trenching activities adjacent to Lot 49. A1-WEST-SW was collected 7 ft west of the western Site boundary. A detailed description of the sample collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
A1-WEST-SW (7′)	7	0	SANDY SILT; medium/coarse; brown; moist; no odor; trace SAND (fine) and GRAVEL (medium, sub-round).
Trip Blank	N/A	N/A	QA/QC Sample
N/A = Not Applicable QA/QC = Quality Assurance and Quality Control			

On May 23, 2014, a slight odor (potentially petroleum in nature) was observed during trenching activities around the historic building foundation on western adjacent Lot 49. Integral collected one sidewall sample (B1-SW) in the area of highest suspected contamination to document offsite soil conditions to the west. B1-SW was collected 6 ft west of the western Site boundary. A detailed description of the sample collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
B1-SW (12′)	12	90	SAND; medium/fine; grey; moist/wet; moderate odor; some SILT and GRAVEL (medium, sub-round).
Trip Blank	N/A	N/A	QA/QC Sample

On May 27, 2014, Integral collected one sidewall sample (C1-SW) to document offsite soil conditions to the west during pre-trenching activities adjacent to Lot 49. C1-SW was collected 7 ft west of the western Site boundary. A detailed description of the sample collected is provided below:

Sampler: FW			
Location	Depth (ftbg)	PID (ppm)	Description
C1-SW(12′)	12	0	SANDY SILT; medium; brown; wet; no odor; trace COBBLES and GRAVEL (large, sub-round).
Trip Blank	N/A	N/A	QA/QC Sample

On May 30, 2014, a slight odor (potentially petroleum in nature) was observed during trenching activities around the historic building foundation on western adjacent Lot 49. Integral collected one sidewall sample (D1-SW) in the area of highest suspected contamination designated to document offsite soil conditions to the west. D1-SW was collected 7 ft west of the western Site boundary. A detailed description of the sample collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
D1-SW(12′)	12	125	SAND; medium; grey/black; moist/wet; moderate odor; some SILT and GRAVEL (large, round).
Trip Blank	N/A	N/A	QA/QC Sample

On June 2, 2014, Integral collected one sidewall sample (E1-SW) to document offsite soil conditions to the west during pre-trenching activities along adjacent Lot 49. E1-SW was collected 7 ft west of the western Site boundary. A detailed description of the sample collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
E1-SW(11′)	11	0	SAND; medium/fine; brown; wet/moist; no odor; some GRAVEL (medium, sub-round) and SILT.
Duplicate	N/A	N/A	QA/QC Sample
Trip Blank	N/A	N/A	QA/QC Sample

On June 3, 2014, Integral collected one sidewall sample (F1-SW) to document offsite soil conditions to the west during pre-trenching activities along adjacent Lot 49. F1-SW was collected 7 ft west of the western Site boundary. A detailed description of the sample collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
F1-SW(11′)	11	0	SAND; medium; brown; moist; no odor; some ORGANICS (wood) and GRAVEL (medium, sub-round).
Trip Blank	N/A	N/A	QA/QC Sample

On June 4, 2014, Integral collected one sidewall sample (G1-SW) to document offsite soil conditions to the west during pre-trenching activities along adjacent Lot 49. G1-SW was collected 7 ft west of the western Site boundary. A detailed description of the sample collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
G1-SW(10′)	10	1	SAND; medium/fine; grey/black/brown; moist/wet; faint odor; some GRAVEL (medium, round) and DEBRIS (ash, wood).
G1-SW(10′) MS	10	1	QA/QC Sample
G1-SW(10′) MSD	10	1	QA/QC Sample
Trip Blank	N/A	N/A	QA/QC Sample

On June 6, 2014, Integral collected one sidewall sample (G1-SOUTH-SW) to document offsite soil conditions to the south during pre-trenching activities adjacent to West 27th Street. G1-SOUTH-SW was collected 4 ft south of the southern Site boundary. A detailed description of the sample collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
G1-SOUTH-SW(7′)	7	1	SAND; medium; brown; moist; no odor; some SILT and GRAVEL (medium, round); trace DEBRIS (wood and concrete).
Trip Blank	N/A	N/A	QA/QC Sample

On June 10, 2014, Integral collected one sidewall sample (G2-SOUTH-SW) to document offsite soil conditions to the south during pre-trenching activities adjacent to West 27th Street. G2-SOUTH-SW was collected 4 ft south of the southern Site boundary. A detailed description of the sample collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
G2-SOUTH-SW(7')	10	0	SAND; medium; light brown; moist; no odor; some SAND (coarse) and GRAVEL (small, round)
Trip Blank	N/A	N/A	QA/QC Sample

4.4.2 Offsite Sidewall Soil Sample Results

Excavation sidewall samples were collected outside of the property boundary to document offsite soil conditions, as all soil within the property boundary was removed during the implementation of the Remedial Action.

4.4.2.1 VOCs

One VOC was detected in one of 25 above offsite sidewall samples above Unrestricted Use SCOs. 2-Butanone was detected in sample B1-SW [12'] at 0.15 mg/kg exceeding its Unrestricted SCO of 0.12 mg/kg.

4.4.2.2 SVOCs

Analytical results for SVOCs indicate that concentrations of various SVOCs exceeded their respective Unrestricted Use SCOs in five (A1-WEST-SW [7']; A6-SW [3']; C1-SW [12']; D2-SW [3.5']; and D6-SW [2']), out of 25 soil samples, with all of the exceedances occurring above 12 ftbg. Below is a summary of SVOC concentration ranges and distribution in shallow samples.

Unrestricted Use SCOs

Concentrations of benzo(a)anthracene exceeded its Unrestricted Use SCO of 1.0 mg/kg in samples A1-WEST-SW(7'), A6-SW(3'), C1-SW(12') , D2-SW(3.5') and D6-SW(2') ranging from 1.7 mg/kg in sample A1-WEST-SW(7')to 40.0 mg/kg in sample D2-SW (3.5').

Concentrations of benzo(a)pyrene exceeded its Unrestricted Use SCO of 1.0 mg/kg in samples A1-WEST-SW(7'), A6-SW 3'), C1-SW(12') , D2-SW(3.5') and D6-SW(2') ranging from 1.5 mg/kg in sample A1-WEST-SW(7') to 34.0 mg/kg in sample D2-SW (3.5').

Concentrations of benzo(b) fluroanthene exceeded its Unrestricted Use SCO of 1.0 mg/kg in samples A1-WEST-SW(7'), A6-SW(3'), C1-SW(12') , D2-SW(3.5') and

D6-SW(2'); ranging from 1.8 mg/kg in sample A1-WEST-SW(7') to 43.0 mg/kg in sample D2-SW(3.5').

Concentrations of benzo(k)fluoranthene exceeded its Unrestricted Use SCO of 0.8 mg/kg in soil samples C1-SW(12'), D2-SW(3.5') and D6-SW(2'); ranging from 1.1 mg/kg in sample C1-SW(12') to16 mg/kg in sample D2-SW(3.5').

Concentrations of chrysene exceeded its Unrestricted Use SCO of 1.0 mg/kg in samples A6-SW(3'), C1-SW(12'), and D2-SW(3.5'); ranging from 2.3 mg/kg in sample C1-SW(12') and 39 mg/kg in sample D2-SW(3.5').

Concentrations of dibenzo(a,h)anthracene exceeded its Unrestricted Use SCO of 0.33 mg/kg in samples A6-SW(3'), D2-SW(3.5') and D6-SW(2') ranging from 0.83 mg/kg in sample D6-SW(2') to 5.8 mg/kg in sample D2-SW(3.5').

Concentrations of indeno(1,2,3-cd)eyrene exceeded its Unrestricted Use SCO of 0.5 mg/kg in samples A1-WES-SW(7'), A6-SW(3'), D2-SW(3.5') and D6-SW(2') ranging from 1.2 mg/kg in sample A1-WEST-SW(7') to 16 mg/kg in sample D2-SW(3.5').

4.4.2.3 PCBs

Analytical results for PCBs indicate that concentrations of three PCB isomers exceeded their respective Unrestricted Use SCOs in two out of 25 offsite soil samples, with all of the exceedences occurring above 2.5 ftbg. Below is a summary of PCB concentration ranges and distribution in shallow samples.

Unrestricted Use SCOs

Aroclor 1248 was detected in soil sample C6-SW(2.5') at 0.217 mg/kg, which exceeds its Unrestricted Use SCO of 0.1 mg/kg.

Concentrations of aroclor 1254 exceeded its Unrestricted Use SCO of 0.1 mg/kg in samples C6-SW(2.5') and D6-SW(2') at 0.349 mg/kg and 0.229 mg/kg respectively.

Concentrations of aroclor 1260 exceeded its Unrestricted Use SCO of 0.1 mg/kg in samples C6-SW(2.5') and D6-SW(2') at 0.164 mg/kg and 0.218 mg/kg respectively.

4.4.2.4 Pesticides

Analytical results for pesticides indicate that concentrations of two pesticides exceeded their respective Unrestricted Use SCOs in four out of 25 soil samples, with all of the exceedences occurring above 12 ftbg. Below is a summary of pesticide concentration ranges and distribution in shallow samples.

Unrestricted Use SCOs

Concentrations of 4,4'-DDT exceeded its Unrestricted Use SCO of 0.0033 mg/kg in samples are A1-WEST-SW(7'), A6-SW(3'), B1-SW(12') and D6-SW(2'); ranging from 0.00731 mg/kg in sample D6-SW(2') to 0.0782 mg/kg in sample A6-SW(3').

4, 4'-DDE was detected in soil sample A1-WEST-SW(7') at 0.0112 mg/kg, which exceeds its Unrestricted Use SCO of 0.1 mg/kg.

Concentrations of 4,4'-DDE exceeded its Unrestricted Use SCO of 0.1 mg/kg in samples A1-WEST-SW(7') and C1-SW(12') at 0.164 mg/kg and 0.00566 mg/kg respectively.

4.4.2.5 Total Metals

Analytical results for total metals indicate that concentrations of various metals exceeded their respective Unrestricted Use SCOs in 11 out of 25 soil samples, with all of the exceedances occurring above 12 ft below grade. Below is a summary of metal concentration ranges and distribution in shallow samples.

Unrestricted Use SCOs

Total arsenic was detected in soil sample D2-SW(3.5') at 51 mg/kg, which exceeds its Unrestricted Use SCO of 13 mg/kg.

Concentrations of total barium exceeded its Unrestricted Use SCO of 350 mg/kg in samples A6-SW(3'), B6-SW(3'), C1-SW(12'), C6-SW(2.5'), D2-SW(3.5'), and D6-SW(2'); ranging from 450 mg/kg in sample C6-SW(2.5') to 1,200 mg/kg in sample D2-SW(3.5').

Concentrations of total cadmium exceeded its Unrestricted Use SCO of 2.5 mg/kg in samples C6-SW(2.5'), D2-SW(3.5'), and D6-SW(2'); ranging from 3.7 mg/kg in sample C6-SW(2.5') to 4.8 mg/kg in sample D6-SW(2').

Concentrations of total copper exceeded its Unrestricted Use SCO of 50 mg/kg in samples C6-SW(2.5'), D2-SW(3.5'), and D6-SW(2'); ranging from 140 mg/kg in sample D6-SW(2') to 290 mg/kg in sample D2-SW(3.5').

Concentrations of total lead exceeded its Unrestricted Use SCO of 63 mg/kg in samples A1-WEST-SW(7'), A6-SW(3'), B1-SW(12'), B6-SW(3'), C1-SW(12'), C6-SW(2.5'), D2-SW(3.5'), D6-SW(2'), and G1-SOUTH-SW(7.5'); ranging from 88 mg/kg in sample B1-SW(12'), to 2,000 mg/kg in sample D2-SW (3.5').

Concentrations of total mercury exceeded its Unrestricted Use SCO of 0.18 mg/kg in samples A1-WEST-SW(7'), A6-SW(3'), B1-SW(12'), B6-SW(3'), C1-SW (12'), C6-SW (2.5'), D2-SW(3.5'), D6-SW(2'), F1-SW (11'), and F2-SW (4.5'); ranging from 0.22 mg/kg in sample B1-SW(12'), to 3.6 mg/kg in sample D2-SW(3.5').

Concentrations of total nickel exceeded its Unrestricted Use SCO of 0.30 mg/kg in samples A1-WEST-SW(7'), A6-SW(3'), B1-SW(12'), C1-SW(12'), C6-SW(2.5'), D2-SW(3.5'), and D6-SW(2'); ranging from 31 mg/kg in sample D6-SW(2'), to 93 mg/kg in sample A1-WEST-SW(7').

Total silver was detected in soil sample C6-SW(2.5') at 2.8 mg/kg, which exceeds its Unrestricted Use SCO of 2 mg/kg.

Concentrations of total zinc exceeded its Unrestricted Use SCO of 109 mg/kg in samplesA6-SW(3'), B6-SW(3'), C1-SW(12'), C6-SW(2.5'), D2-SW(3.5'), D6-SW(2'), and G1-SOUTH-SW(7.5'); ranging from 160 mg/kg in sample G1-SOUTH-SW(7.5'), to 2,100 mg/kg in sample D2-SW(3.5').

A table summarizing all offsite sidewall sampling results with highlighted exceedences of SCOs is included as Table 5. Figure 4 details the offsite sidewall sample locations.

Data Usability Summary Reports (DUSRs) were prepared for all data generated in this remedial performance evaluation program. These DUSRs are included in Appendix F, and associated raw is provided electronically in Appendix E.

4.4.3 Excavation Endpoint Soil Sampling

Excavation bottom endpoint samples were collected at areas within the remedial excavation that did extend into bedrock. Bottom endpoint samples were collected at a rate of one sample per every 900 ft^2 in order to document that Unrestricted SCOs had been achieved at final subgrade elevations. In some instances final excavation depths were extended to meet design changes and/or remedial goals, however no deviations from the RAWP were made, as all extended depths were already below 15 ftbg. Prior to the collection of each bottom endpoint sample, measurements were taken from surveyed elevation markers at the Sites perimeter. These measurements were used to confirm that the location of each sample was representative of a 900 ft^2 area. Endpoint samples were logged and screened with a PID. QA/QC samples were collected in accordance with the approved QAPP.

On June 27, 2014, Integral collected four bottom endpoint samples from the final

remedial excavation completion elevation of EL-6 (~17 ftbg) located in the central portion of the Site. A detailed description of the samples collected is provided below:

Sampler: SGM			
Location	Depth (ftbg)	PID (ppm)	Description
A5-EP-EL (-6)	~17	0	SANDY fine SILT; light brown; moist/wet; no odor; trace MICA and CLAY lenses.
B5-EP-EL (-6)	~17	0	SANDY fine SILT; light brown; moist/wet; no odor; trace MICA and CLAY lenses.
B5-EP-EL (-6) MS	~17	0	As Above: QA/QC Sample
B5-EP-EL (-6) MSD	~17	0	As Above: QA/QC Sample
B6-EP-EL (-6)	~17	0	SANDY fine SILT; light brown; moist/wet; no odor; trace MICA, PEBBLES (small, sub-round) and CLAY lenses.
C5/C6-EP-EL (-6)	~17	0	SANDY fine SILT; light brown; moist/wet; no odor; trace MICA and CLAY lenses.
Duplicate	N/A	N/A	QA/QC Sample; Duplicate of B6-EP-EL (-6)
Trip Blank	N/A	N/A	QA/QC Sample

On July 2, 2014, Integral collected two 2 bottom endpoint samples from the final remedial excavation completion elevation of EL-5.75 (~17 ftbg) located in the northern portion of the Site. A detailed description of the samples collected is provided below:

Sampler: SM			
Location	Depth (ftbg)	PID (ppm)	Description
A4-EP-EL (-5.75)	~17	0	SAND; fine; light brown; moist/wet; no odor; some SILT.
B4/C4-EP-EL (-5.75)	~17	0	SAND; fine; light brown; moist/wet; no odor; some SILT.
Trip Blank	N/A	N/A	QA/QC Sample

On July 10, 2014, Integral collected two 2 bottom endpoint samples from the final remedial excavation completion elevation of EL-5.75 (~17 ftbg) located in the northern portion of the Site. A detailed description of the samples collected is provided below:

Sampler: SM			
Location	Depth (ftbg)	PID (ppm)	Description
A3-EP-EL (-5.75)	~17	0	SAND; fine/medium; brown; wet; no odor; some SILT and MICA.
B3-EP-EL (-5.75)	~17	0	CLAYEY SILT; light brown; no odor; trace SAND (fine) and MICA.
Trip Blank	N/A	N/A	QA/QC Sample

On August 5, 2014, Integral collected one bottom endpoint sample from the final remedial excavation completion elevation of EL-5.75 (~17 ftbg) located in the central portion of the Site. A detailed description of the samples collected is provided below:

Sampler: SM			
Location	Depth (ftbg)	PID (ppm)	Description
C2/C3-EP-EL-5.75	~17	0	SANDY medium/fine SILT; light brown; moist; no odor; trace MICA.
C2/C3-EP-EL-5.75 MS	~17	0	As Above: QA/QC Sample
C2/C3-EP-EL-5.75 MSD	~17	0	As Above: QA/QC Sample
Trip Blank	N/A	N/A	QA/QC Sample

On August 7, 2014, Integral collected one bottom endpoint sample from the final remedial excavation completion elevation of EL-5.75(~17 ftbg) located in the central portion of the Site. A detailed description of the samples collected is provided below:

Sampler: SM			
Location	Depth (ftbg)	PID (ppm)	Description
B2-EP-EL-5.75	~17	0	SILTY fine SAND; brown; moist; no odor; trace MICA and GRAVEL (small, round).
DUPLICATE	~17	0	As Above: QA/QC Sample
FIELD BLANK	N/A	N/A	QA/QC Sample
Trip Blank	N/A	N/A	QA/QC Sample

On August 18, 2014, Integral collected one bottom endpoint sample from the final remedial excavation completion elevation of EL-6.75(~18 ftbg) located in the central portion of the Site. A detailed description of the samples collected is provided below:

Sampler: SM			
Location	Depth (ftbg)	PID (ppm)	Description
C2/C3-EP-EL-6.75	~18	0	SILTY fine SAND; light brown; damp; no odor; some MICA; trace SAND (medium) and GRAVEL (small, round).
Trip Blank	N/A	N/A	QA/QC Sample

On August 22, 2014, Integral collected one bottom endpoint sample from the final remedial excavation completion elevation of EL-7 (~18 ftbg) located in the northwestern portion of the Site. A detailed description of the samples collected is provided below:

Sampler: SM			
Location	Depth (ftbg)	PID (ppm)	Description
A2-EP-EL-7	~18	0	SANDY fine/medium SILT; light brown; moist; no odor; trace MICA and PEBBLES (small, round).
Trip Blank	N/A	N/A	QA/QC Sample

4.4.4 Endpoint Soil Sample Results

The remedial excavation was extended beyond the foundation design in two 900 ft^2 areas which exhibited concentrations of compounds above Unrestricted Use SCOs. In one area the excavation was extended into bedrock and in the other area the excavation was extended one foot deeper and another endpoint sample was collected to document Track 1 conformance. 4-4'-DDD was detected in bottom sample C2/C3-EP (EL-5.75) at 0.00834 mg/kg, exceeding its Unrestricted SCO of 0.0033 mg/kg. Consequently, all material within the 900 ft^2 area represented by this sample was excavated one additional foot deeper and another endpoint sample was collected (C2/C3-EP [EL-6.75]). The results of the aforementioned deeper sample met Track 1 Unrestricted Use SCOs. Total nickel was detected in bottom sample A2-EP (EL-7) at 160 mg/kg, exceeding its Unrestricted SCO of 30 mg/kg. Consequently, all material within the 900 ft^2 area represented by this sample was excavated to bedrock.

Trivalent chromium data from 31 previously collected samples (Table 12) was below the Unrestricted SCO for all samples throughout the entire Site and shows that

chromium impacts were not present in any site soil or fill using even the most stringent criteria. Based upon this data, Integral discussed and agreed with the Department Project Engineer, the use of the trivalent Unrestricted SCO (30 mg/kg) for purposes of the end-point sampling comparison. This conclusion was memorialized in a technical memorandum dated and submitted to the Department on November 17, 2014, and is included as Appendix S.

All final excavation endpoint samples met Unrestricted Use SCOs. The results of the endpoint sampling demonstrate that Track 1 Unrestricted Use SCOs have been achieved onsite.

A table summarizing all bottom endpoint sampling results is included as Table 11. Figure 5 details the locations of the bottom endpoint samples.

DUSRs were prepared for all data generated in this remedial performance evaluation program. These DUSRs are included in Appendix F, and associated raw is provided electronically in Appendix E.

4.5 IMPORTED BACKFILL

For the purposes of this project, backfill was limited to standard construction materials, such as concrete, flowable fill (concrete/clean sand mixture) and stone that are not subject to analytical testing requirements or regulatory approvals.

4.6 CONTAMINATION REMAINING AT THE SITE

The design and implementation of the Remedial Action was successful in removing all material within the metes and bounds of the Site boundary that exceeded Unrestricted SCOs below and into the groundwater table. Much of the Site was excavated to and into bedrock. Effluent samples collected from the dewatering system indicate no exceedences of TOGS AQWS. Therefore, no contamination remains at the Site and engineering/institutional controls to protect human health and the environment are not necessary.

4.7 CAP SYSTEM

The remedy for the Site did not require the construction of any engineering control systems. A structural foundation slab, along with placement of a waterproofing membrane beneath the slab and along foundation side walls, was installed as part of new

construction.

4.8 INSTITUTIONAL CONTROLS

Institutional Controls (IC) are not required for a Track 1 Cleanup.

4.9 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

Deviations from the RAWP were not encountered during the implementation of the Remedial Action.

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